

# Evolutionary Acquisition Strategies



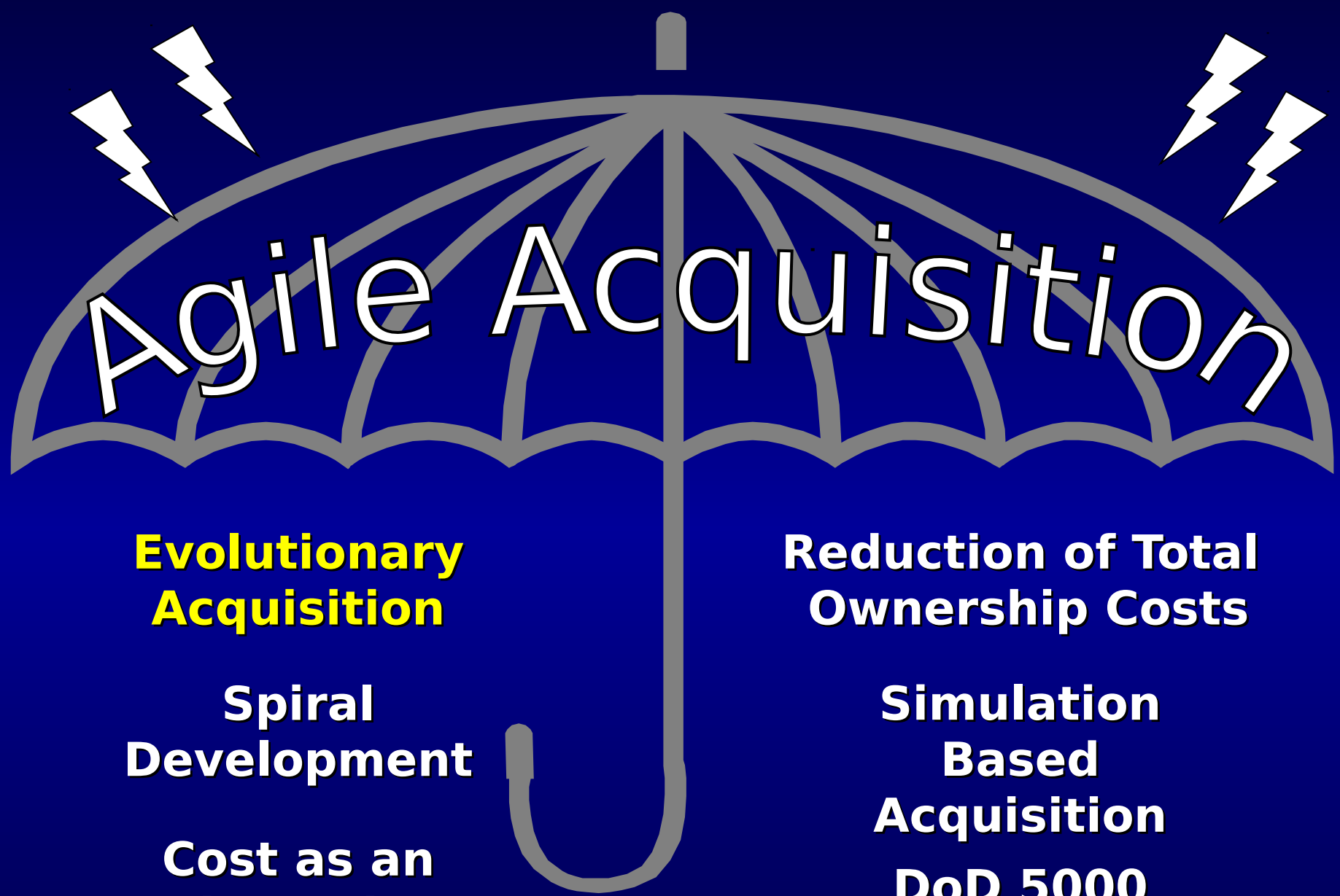
**Mr. Ken Farkas, PMP  
PhD**

**5-7777 x3233**

**Major Paul Thurston,**

**5-7777 x3276**

**[www.afit.edu](http://www.afit.edu)**



# Agile Acquisition

## **Evolutionary Acquisition**

**Spiral Development**

**Cost as an Independent Variable**

## **Reduction of Total Ownership Costs**

**Simulation Based Acquisition**

**DoD 5000 Revision**

# Overview

- **Definitions**
- **Why the push to Evolutionary Acquisition Strategies?**
- **Potential effects of Evolutionary Strategies**

# What do we mean by “Evolutionary Acquisition Strategies”

**ev•o•lu•tion** *n.* 1. Any process of formation or growth; development.

**ac•quire** *n.* 1. The ~~act of gaining~~ <sup>delivering warfighting capability</sup>

**strat•e•gy** *n.* 4. A plan or method for achieving a specific goal.

**Plans to develop and deliver  
incremental warfighting capability  
over time**

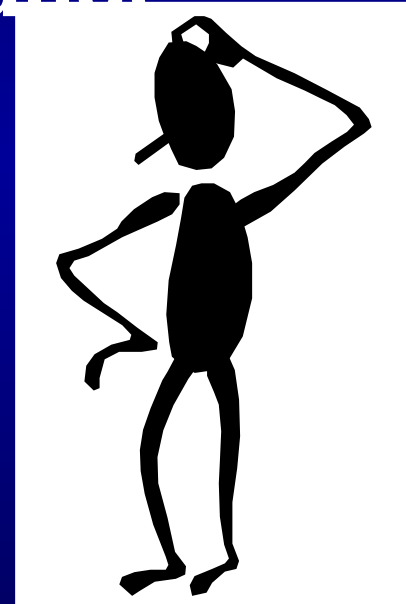
# Programs Evolve

**Why? ....**

- **Technology Advances** →
- **Manufacturing Capability** →
- **Threat Changes** →
- **Operational Deficiencies** →
- **Additional Users** →
- **Additional Missions** →

**Leverage Change?**

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# **Evolutionary Acquisition Defined**

**An acquisition strategy that defines, develops, produces or acquires, and fields an initial hardware or software increment (or block) of operational capability. It is based on technologies demonstrated in the relevant environments, time-phased requirements, and demonstrated manufacturing or software deployment capabilities. These capabilities can be provided in a shorter period of time, followed by subsequent increments of capability over time that accommodate improved technology and allowing full and adaptable systems over time.**

**Mr. Aldridge, USD AT&L**

**Memo to Services, April 12, 2002**

# Call for a New Approach

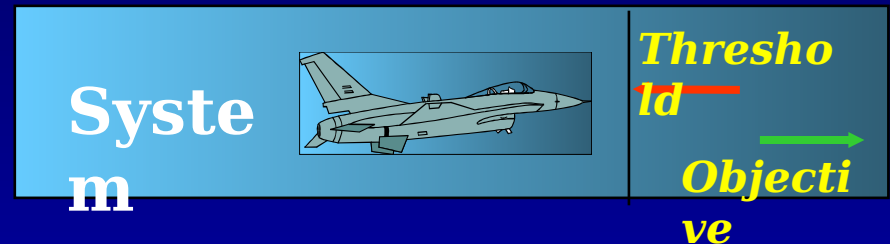
“get new capabilities to the warfighter even faster ...

... fielding new systems with some but not all of their ultimate features ...

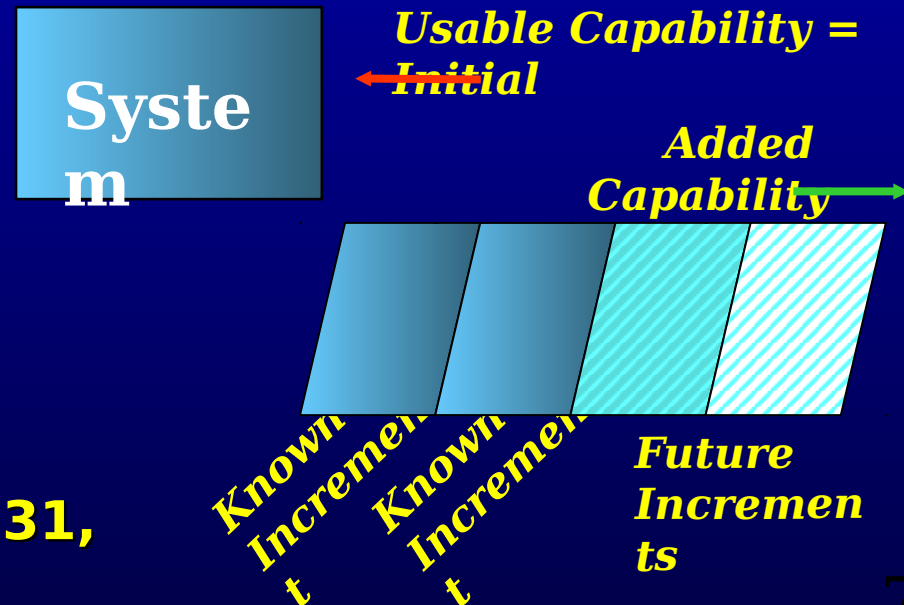
... and adding new technologies in block upgrades as they become available”

**Mr. Aldridge, USD AT&L**  
***InsideDefense.com*, October 31, 2001**

## Traditional Single-step Acquisition



## Evolutionary Acquisition



# **Spiral Development Defined**

**An iterative process for developing a defined set of capabilities within one increment.**

**This process provides the opportunity for interaction between the user, tester, and developer. In this process, the requirements are refined through experimentation and risk management, there is continuous feedback, and the user is provided the best possible capability within the increment. Each increment may include a number of spirals. Spiral development implements evolutionary acquisition.**

**Mr. Aldridge, USD AT&L  
Memo to Services, April 12,  
2002**

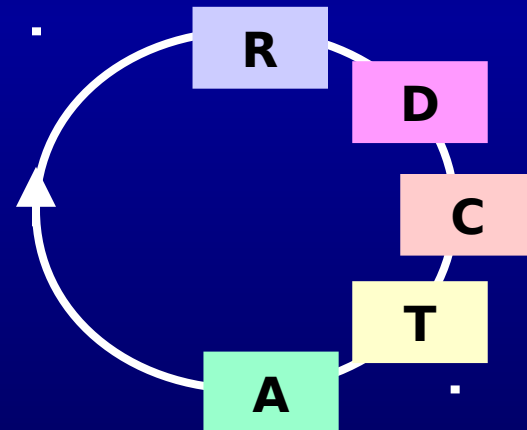
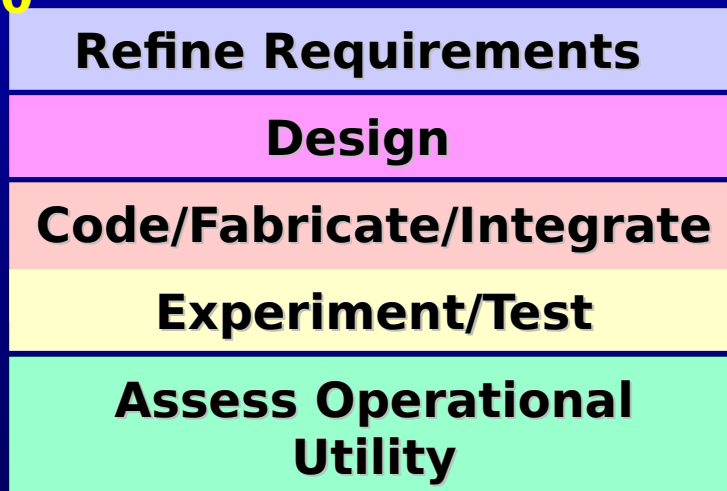


# Single Spiral

**A sub-process** which may include: establishing performance objectives; designing; coding/fabricating/integrating; experimenting; testing; assessing operational utility; making tradeoffs; and delivering.

**AFI 63-123 EA for C2 Systems, 1**

**Apr 2000**



# Multiple Spirals in One Increment

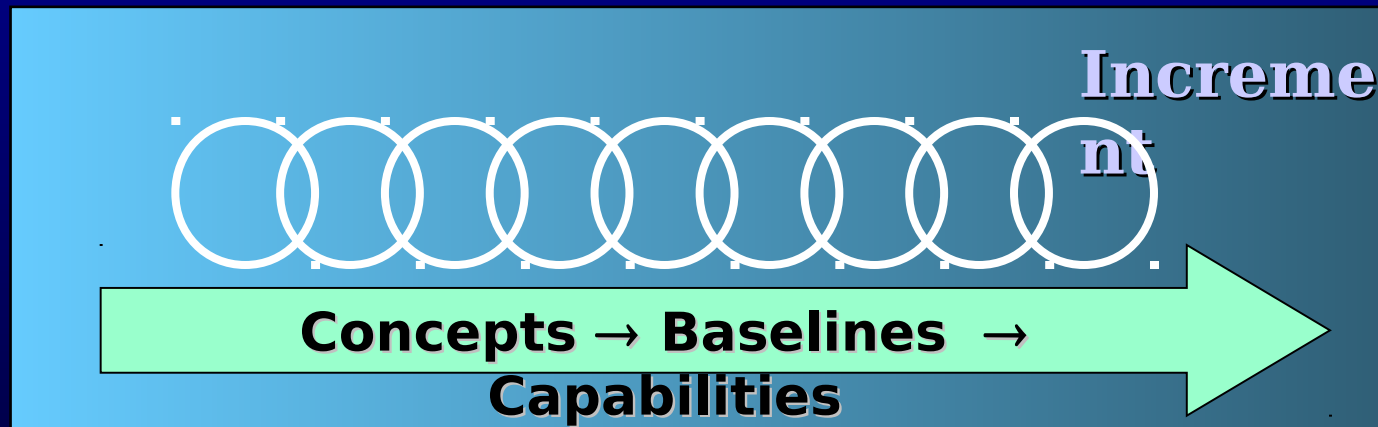
**Concepts** - matures new ideas and technologies into well-defined requirements and initial capabilities.

**Baselines** - refines, integrates, and tests concepts into solutions ready for fielding.

**Capabilities** - integrated solutions into warfighting capabilities, then operates and supports them throughout their life.

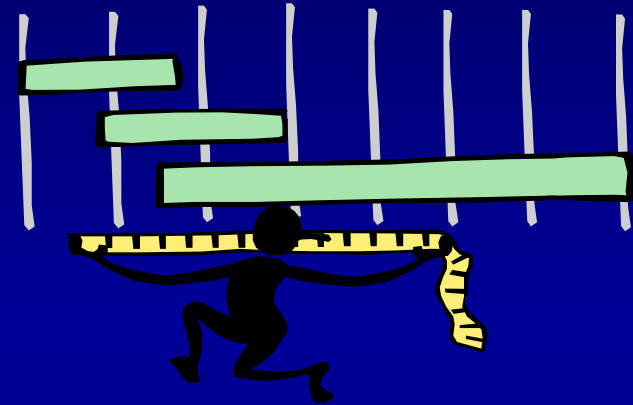
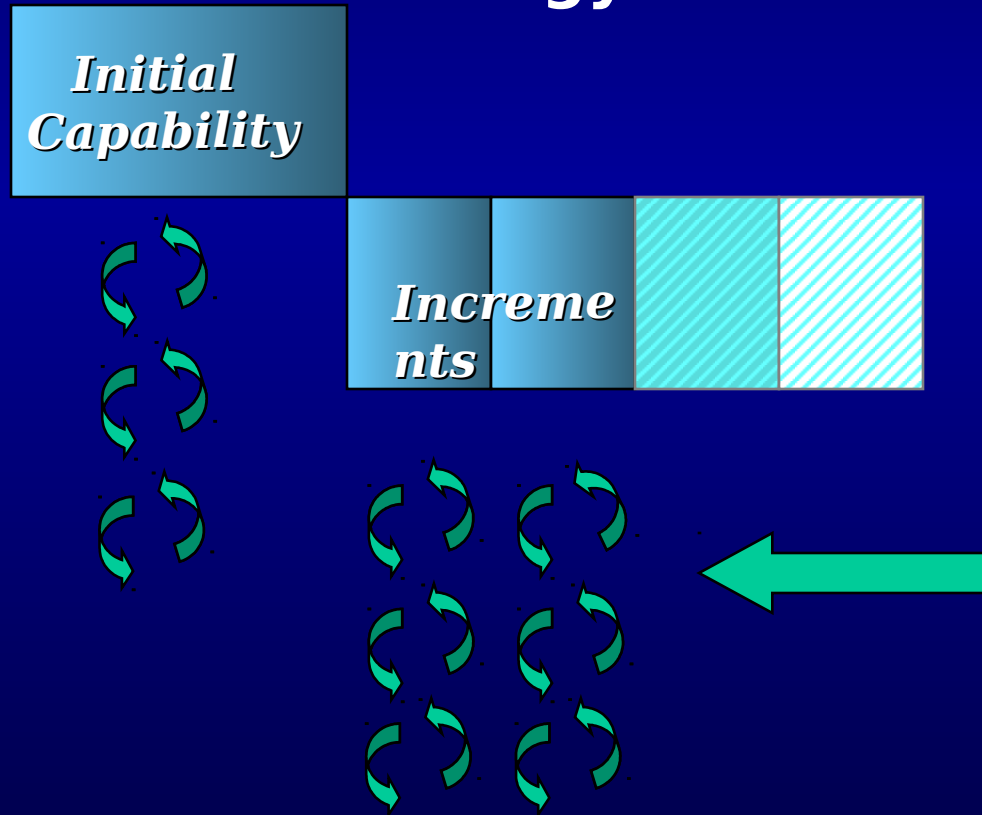
AFI 63-123 EA for C2 Systems, 1

Apr 2000



# Evolutionary Acquisition vs. Spiral Development

**Evolutionary Acquisition  
is a Strategy**



**Spiral Development  
is a Process**

- Within Increment (or Block)
- Applicable for both Single-step and Evolutionary Strategies

# **Why Evolutionary Acquisition?**

## **Problem**

- **Long acquisition response times**
- **Delivered weapon systems' technology at least a generation old**

## **Approach**

- **Take advantage of private sector expertise**
- **Forge a new compact with warfighter**

# Evolutionary Acquisition Policy

- **Initiated in 1993**
  - **Joint Logistics Commanders' (JLC) publication**
  - **Primary applications in C4I community**
- **Updated in 1995**
  - **Alternate acquisition strategy in DoDD 5000.1**
  - **Air Force EA Guide (Draft Nov 2000)**
- **Prescribed in 2001**
  - **Preferred strategy in Jan 2001 update to DoDI 5000.2**
- **Mandated in 2002**
  - **USD(AT&L) Memo 19 Jan 2002**

# **Additional Guidance**

## **DoD 5000 Documents**

- Revision in work, expected to be released this summer to include new definitions and top level templates

## **Requirements**

- Chairman of the Joint Chiefs of Staff Instruction CJCSI3170.01B, 15 April 2001
- Air Force Instruction 10-601, Draft Oct 2001

## **Test**

- Air Force Test and Evaluation, AFI 99-103, Draft 14 February 2002

**Available at AFMC EA COP**

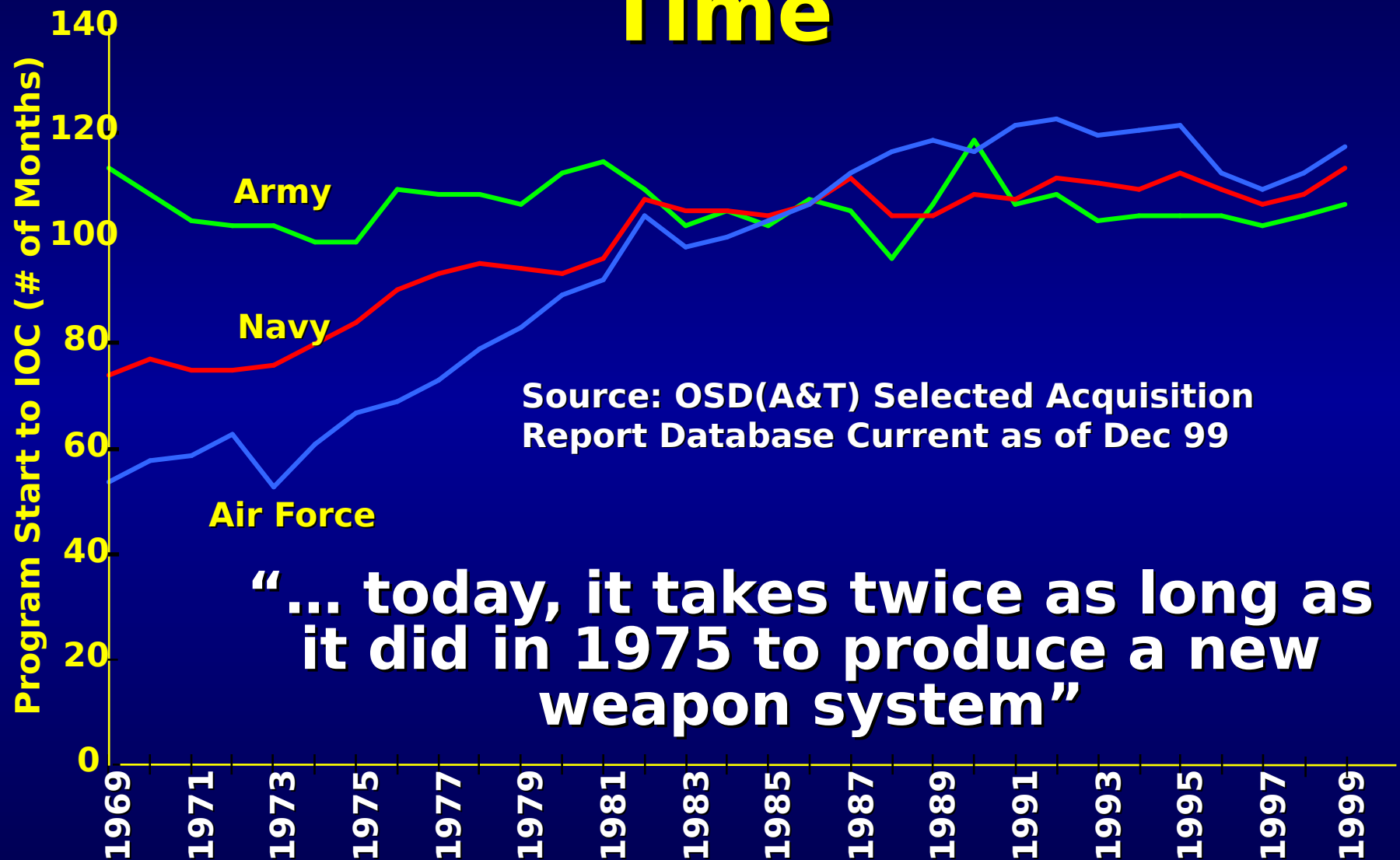
**<https://afkm.wpafb.af.mil/ASPs/A>**

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# **Key Tenets of Evolutionary Acquisition Strategies**

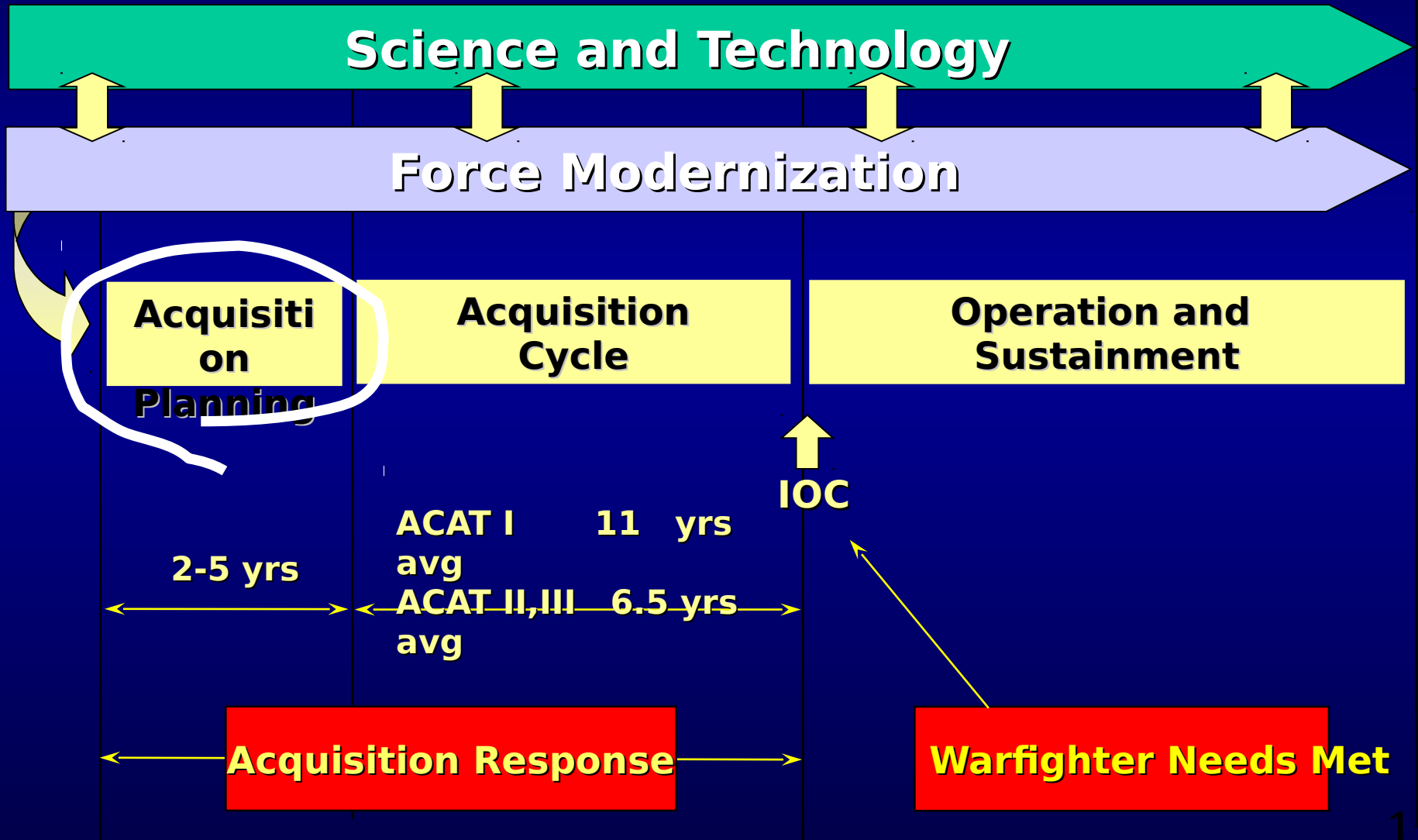
- **Technology aware acquisition professionals**
- **Early involvement with warfighter**
- **Time phased requirements**
- **Tailored decision points for evolutionary development, production and deployment**
- **Long term linkage between evolving requirements, and responsive acquisition, test and sustainment strategies**

# Acquisition Response Time



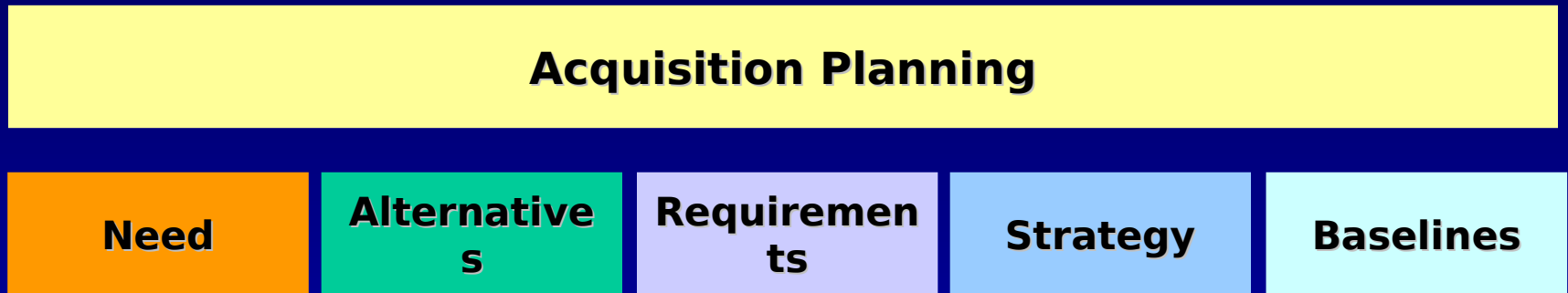


# Acquisition Response Time



# Early Involvement

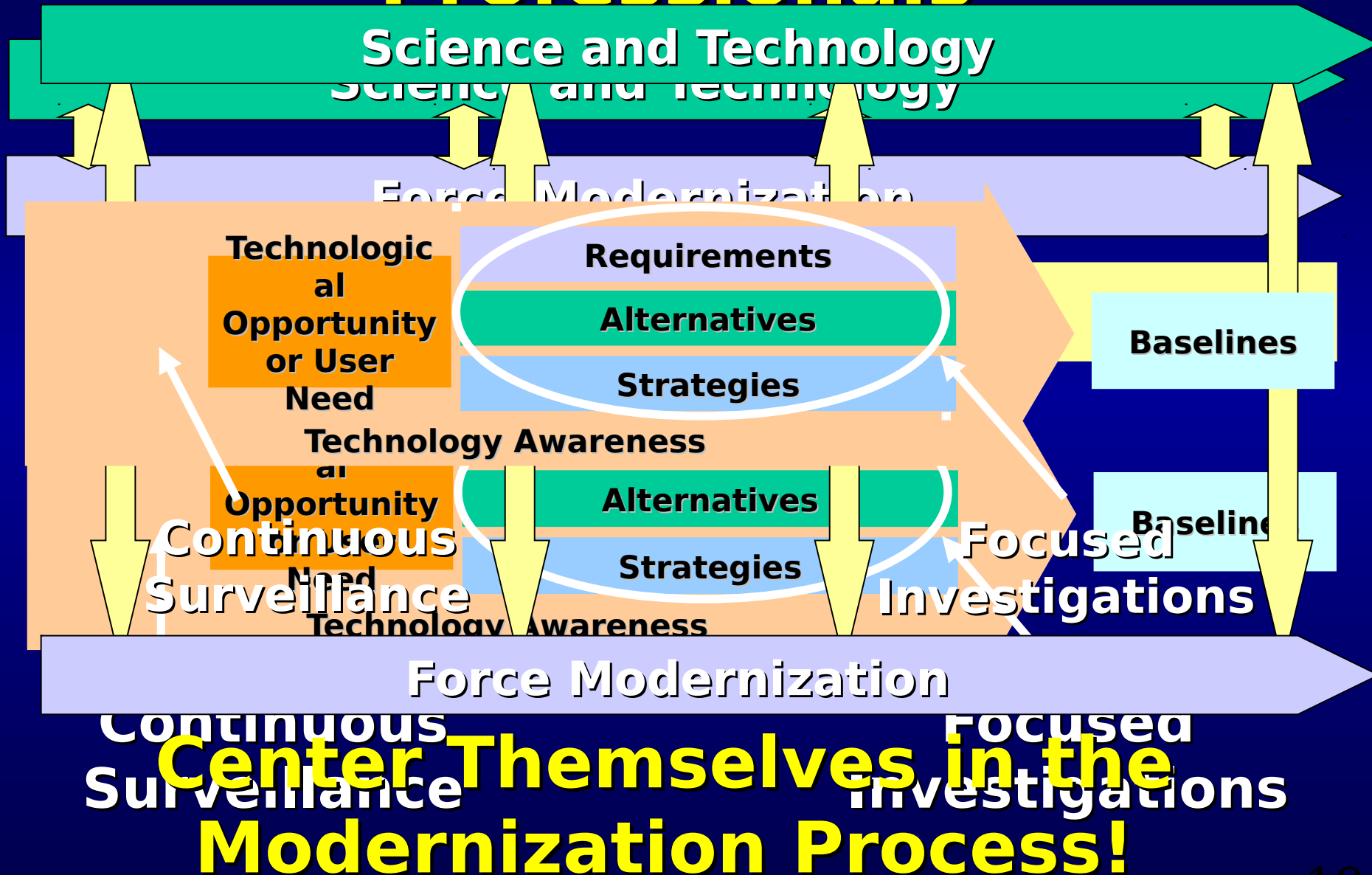
## Traditional



## Evolutionary



# Technology Aware Professionals



# **Compact with the Warfighter**

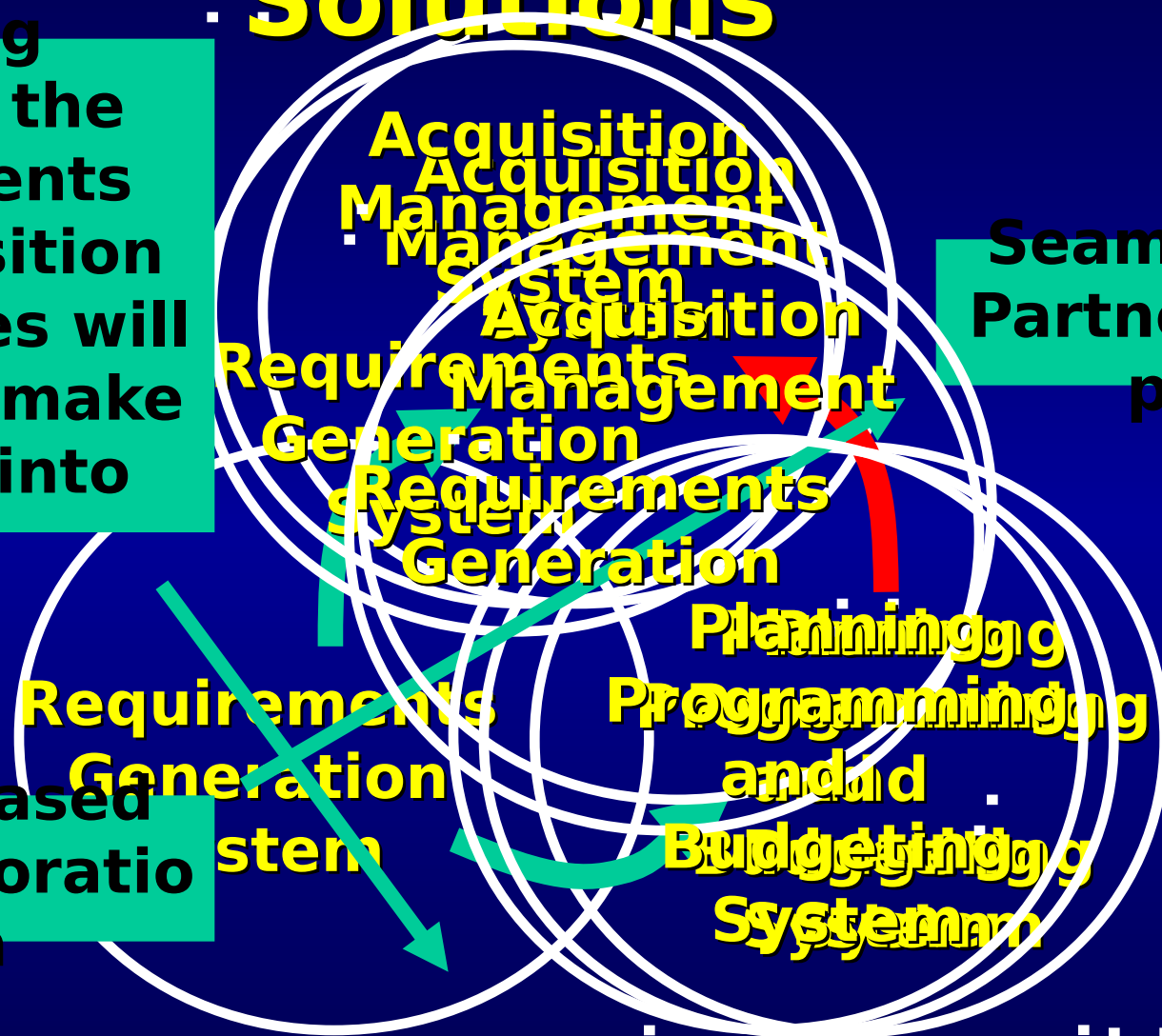
- **The Defense acquisition and requirements communities shall maintain continuous and effective communications with each other and with the operational user.**
- **The objective is to gain a sound understanding of the users' needs and to work with them to achieve a proper balance among cost, schedule, and performance considerations.**

**DoDD 5000.1, Para**

# Obtaining Material Solutions

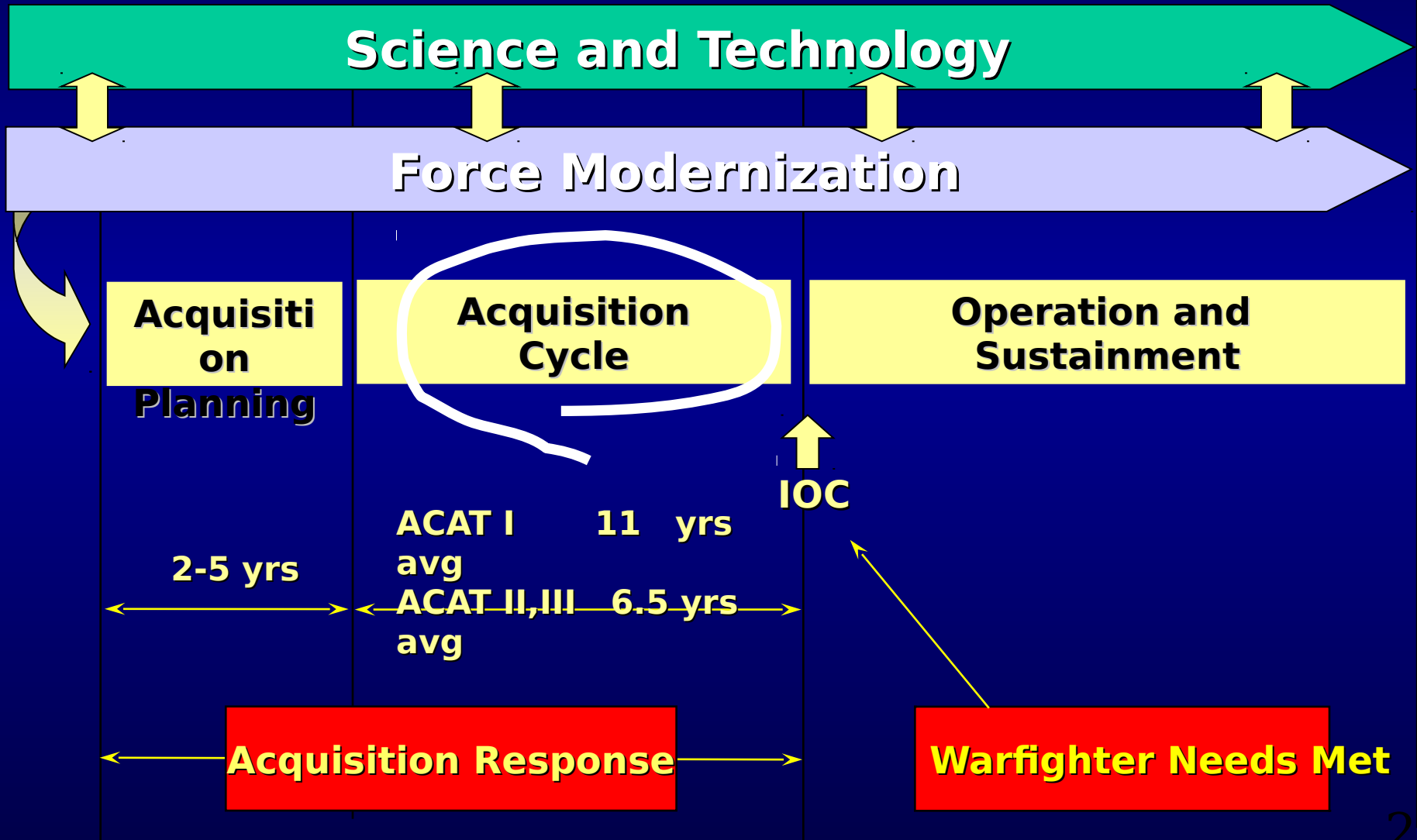
Working together, the requirements and acquisition communities will eventually make progress into PPBS.   
 necessary.

Increased Collaboration



Seamless Partnership

# Acquisition Response Time



# Offer Evolutionary Strategies

## Traditional to the Warfighter

**Acquisition Cycle**  
**Risk Management Efforts**

**Development**

**Production**

## Evolutionary

**Acquisition Cycle**  
**Risk Minimization Efforts**

**Development**

**Production**

**Development**

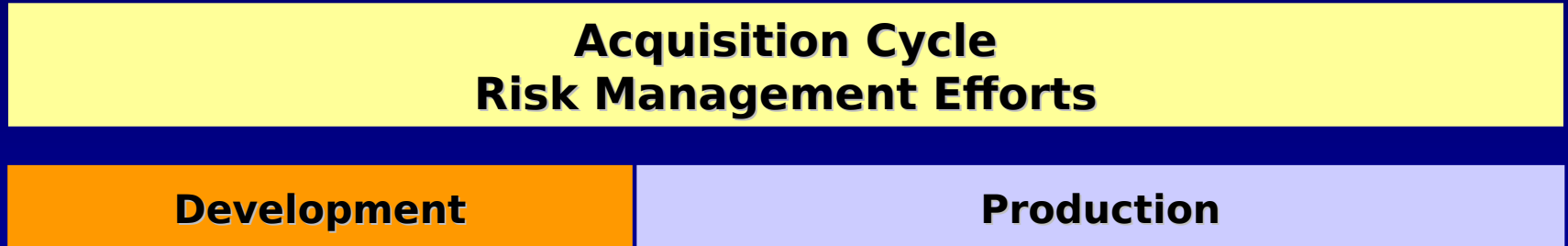
**Production**

**Development**

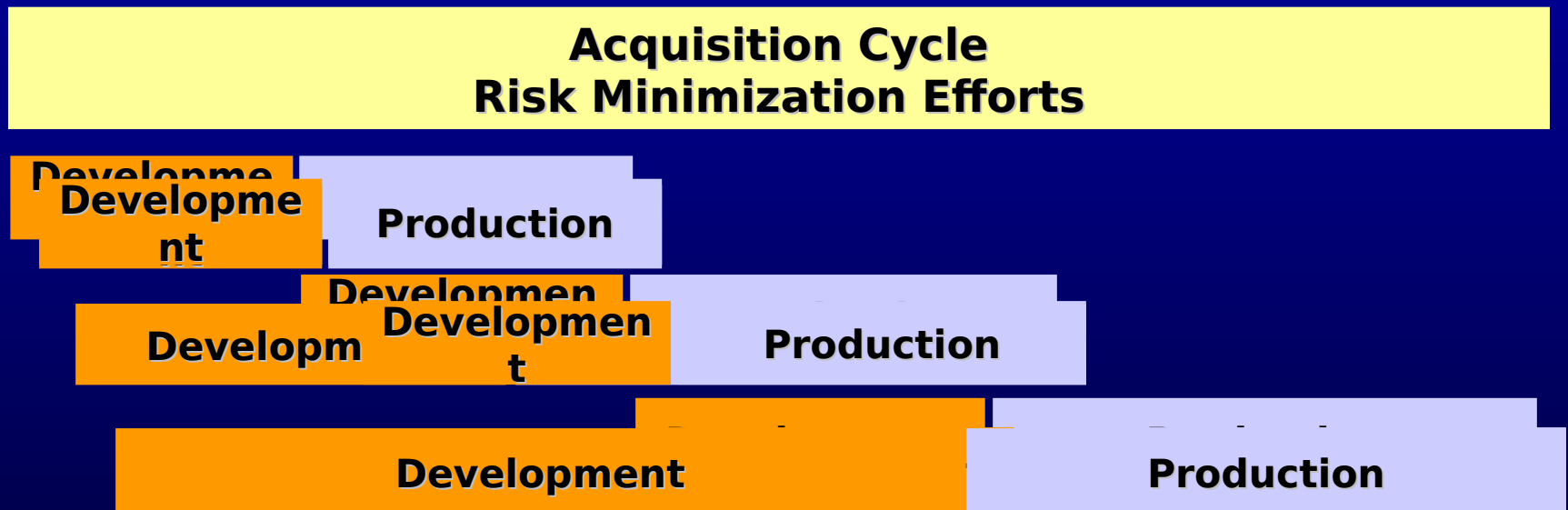
**Production**

# Overlap Varies for Each Program

## Traditional



## Evolutionary





## Requirements

# Time-Phased Requirements

- The validated time-phased requirements generation is an evolutionary approach to **specifying operational requirements in an incremental manner over time matched with projected threat assessments and available technology.**
- Time-phased requirements are **essential** to evolutionary acquisition strategies and are strongly encouraged as a preferred approach to establishing and documenting operational needs.

# FIREBIRD Example

## Need

The Firebird weapon system would be capable of locating and destroying lightly armored enemy ground targets from an unmanned aerial vehicle (UAV) when directed from ground and/or naval ships by friendly forces

## Alternatives



An artist's rendering of a UCAV launching missiles

## Requirements

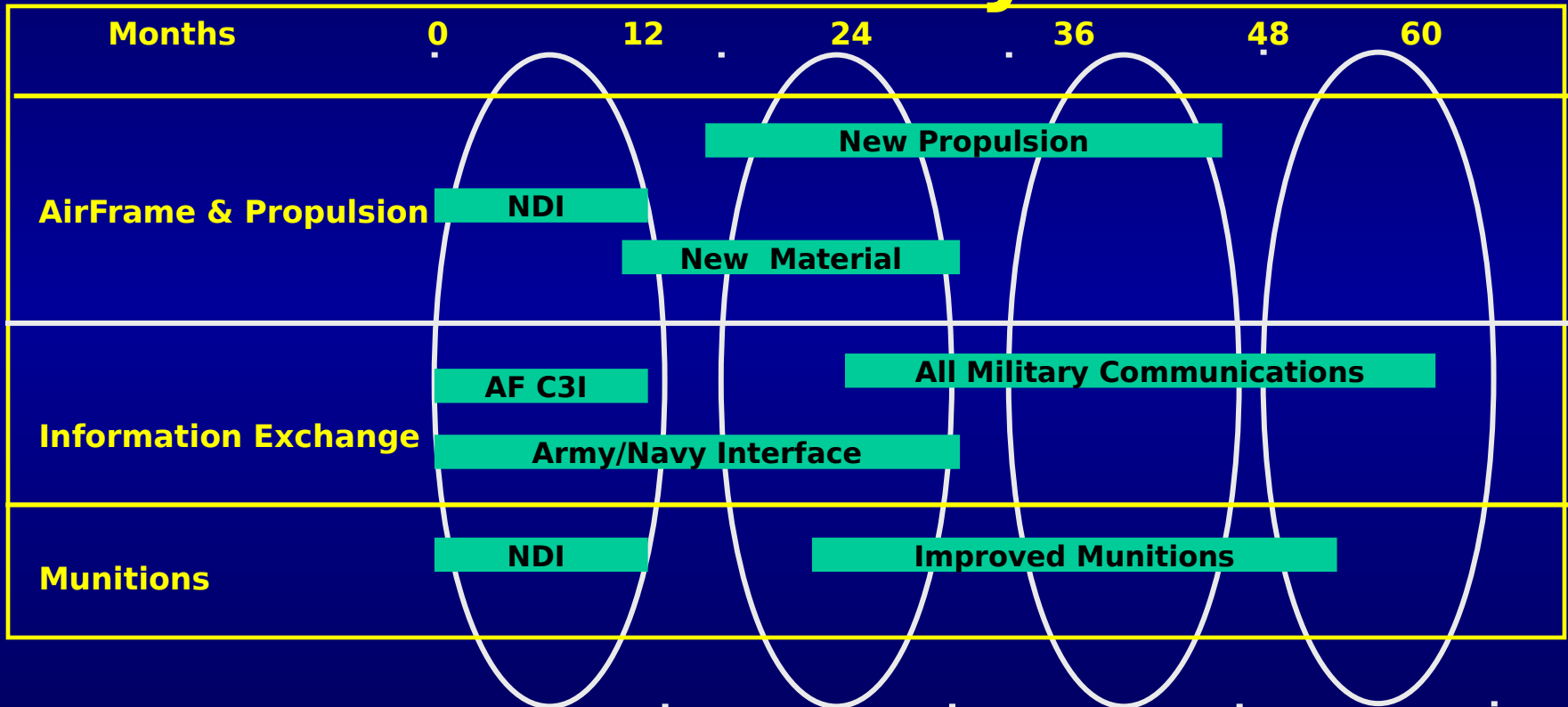
# FIREBIRD Example

KPP	ORD
1. RANGE	Threshold 150 Miles Objective 200 Miles
2. Interoperability	Threshold Link/exchange data with Navy and Army UAV Systems, AWACS, JSTARS, airborne targeting and surveillance platforms Objective - All military communication satellites
3. Loiter	Threshold/Objective 8 hours
4. Explosive Force	Threshold 200 Lbs TNT Objective 500 Lbs TNT
5. Accuracy	Threshold 10 M CEP Objective 5 M CEP
6. Reliability	Threshold 150 hour MTBF Objective 200 hour MTBF

**KPP = Key Performance Parameter**

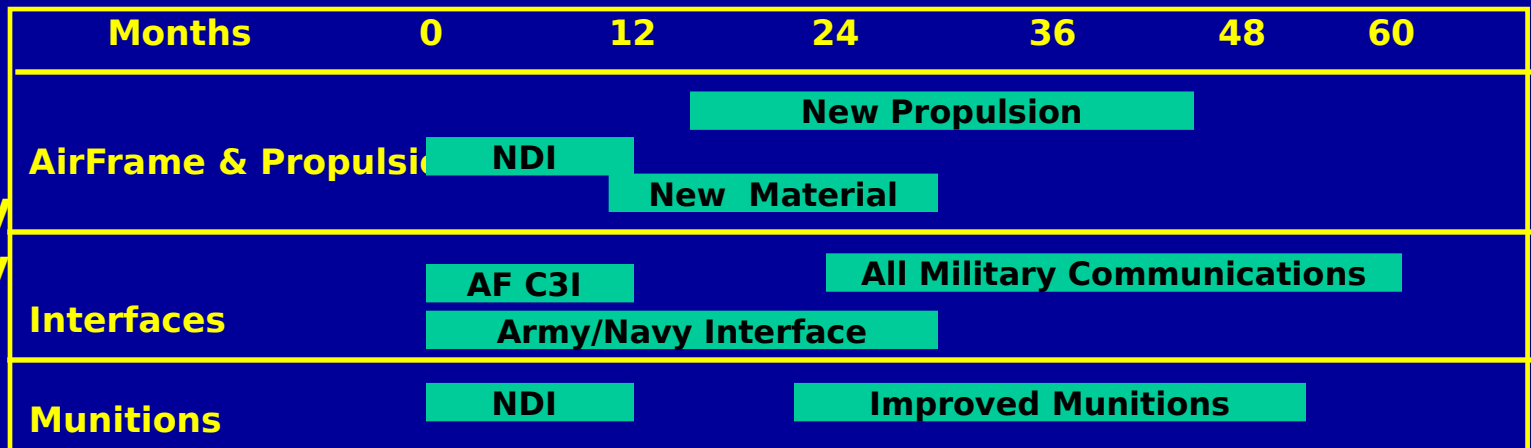
# FIREBIRD EXAMPLE

## Technology Availability





KPP	ORD	12 mos	30 mos	48 mos	60 mos
1. Range	150/200 Mile	120 miles	150 miles	200 miles	200 miles
2. Loiter	3/3 hours	2 hours	2.5 hours	3 hours	3 hours
3. Inter-Operability	AF C3, Army & Navy UAV/ All military comm satellites	Tracking info to AWACS and JSTARS	Tracking info to NAVY ARMY UAV systems	→	Tracking info to ALL military comm Satellites
4. Explosive Force	200/500 Lbs TNT	300 Lbs TNT	→	→	500 lbs TNT
5. Accuracy	10/5 M CEP	10 M CEP	→	→	3 M CEPs
6. Reliability	150/200 hrs MTBF	100 hours MTBF	100 hours MTBF	150 hours MTBF	200 hours MTBF

**Technology Availability**










# TIME PHASED ORD

## Firm Definition of Full Capability

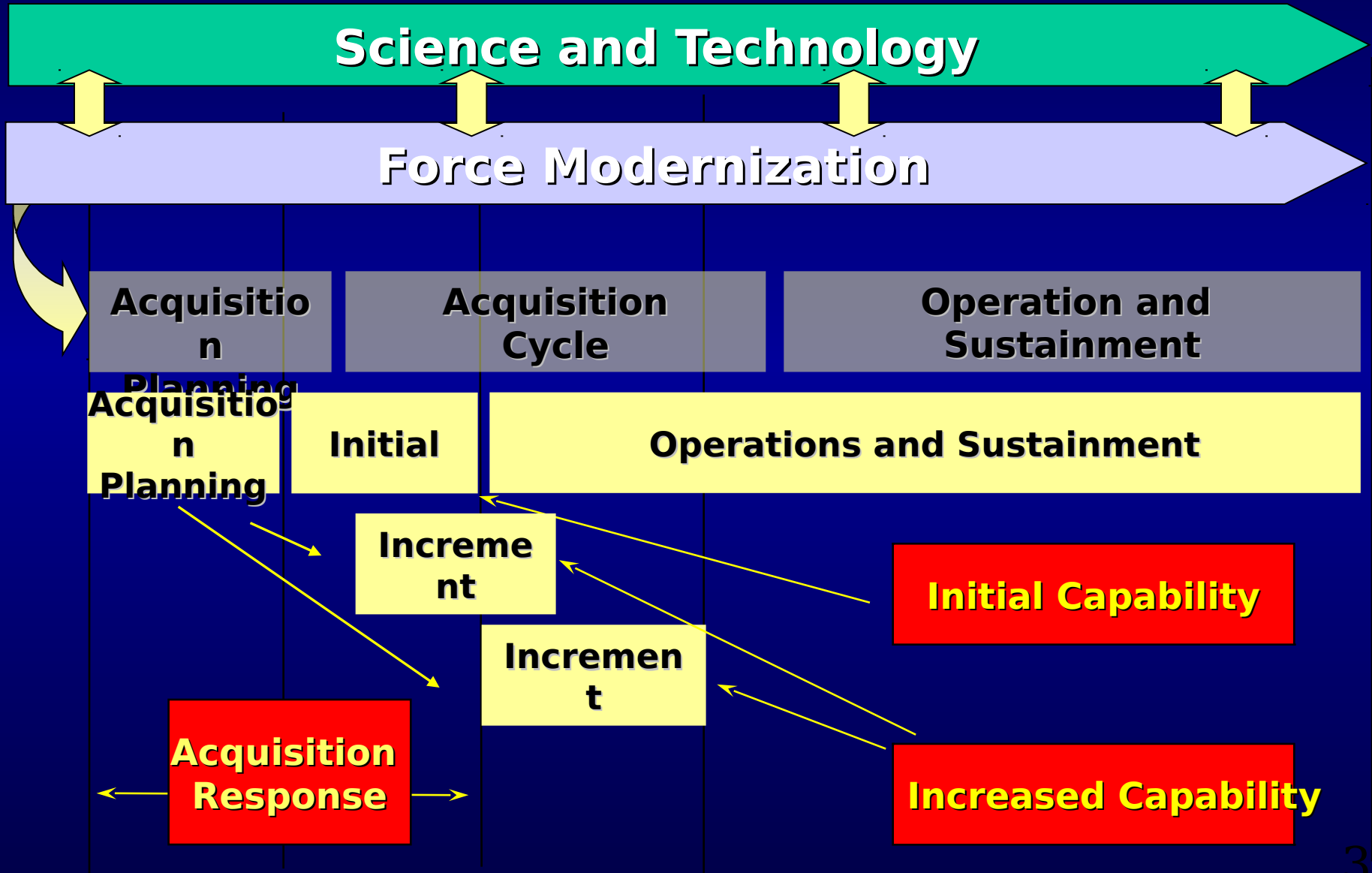
KPP	ORD T/O	Initial Threshold	INC 2 Threshold	INC 3 Threshold	INC 4 Threshold
1. RANGE	150/200	120 Miles	150 Miles	200Miles	200Miles
2. Inter-Operability	AF C3, Army & Navy UAV/ All military comm satellites	Tracking info to AWACS and JSTARS	Tracking info to NAVY ARMY UAV systems		Tracking info to ALL military comm Satellites
3. Loiter	3/3 hours	2 hours	2.5 hours	3 hours	3.0 hrs
4. Explosive Force	200/500 Lbs TNT	300 Lbs TNT			500 lbs TNT
5. Accuracy	10/5 M CEP	10 M CEP			3 M CEP
6.	150/200	100	100	150 hrs	200 hrs

# TIME PHASED ORD

## Defined Initial Plus Full Objective

KPP	ORD T/O	Initial		Full
1. RANGE	150/200	120 Miles		200Miles
2. Inter-Operability	Link/Exchange with everyone	Tracking info to AWACS and JSTARS		Tracking info to ALL military Satellites
3. Loiter	3/3 hours	2 hours		3 hours
4. Explosive Force	200/500 Lbs TNT	300 Lbs TNT		500 lbs TNT
5. Accuracy	10/5 M CEP	10 M CEP		3 M CEP
6. Reliability	150/200 hrs MTBF	100 hours MTBF		200 hrs MTBF

# Acquisition Response Time





# Functional Implications

- Program
- Management Systems
- Engineering Contract
- Management Financial
- Management Test and Evaluation
- Logistics

# **EA Concerns**

- **We're already doing this!**
- **EA programs will take longer and cost more!**
- **You want me to do more, but I'm too busy already!**
- **It won't work for big (small) programs!**
- **Warfighters won't accept partial solutions!**

# Summary

- **Distinguished EA Strategies from the Spiral Development Processes**
- **Described how program evolution can be leveraged to deliver capability earlier**
- **Emphasized that acquisition professionals center themselves in the modernization process**
  - **Getting involved earlier**
  - **Offering evolutionary strategies**
  - **Helping warfighters define time-phased requirements**

# QUESTIONS

!

## Evolutionary Acquisition Strategies



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# Back ups

# Small Diameter Bomb Acquisition Reform

## Approach

